

ABSTRACT

A choke valve useful for sub-sea application, having a valve body forming a bore extending therethrough which provides a body inlet, a body outlet and an insert chamber therebetween, and a removable insert assembly positioned in the insert chamber. The insert assembly includes a tubular cartridge having a side wall forming an internal bore and having a port communicating with the body inlet, whereby high pressure fluid enters through the body inlet; a bonnet connected with and closing the upper ends of the cartridge and the body, the bonnet being disengagably connected with the body, and a pressure reducing flow trim positioned in the cartridge bore, the flow trim having a restrictive opening whereby fluid from the body inlet may enter the flow trim at reduced pressure and pass through the body outlet. Further included is a temperature transmitter carried by the tubular cartridge, and having a temperature sensing component for measuring the temperature at a location in the tubular cartridge and for transmitting signals indicative thereof. Preferred are two temperature transmitters, the first located within the tubular cartridge and having a temperature sensing component located adjacent the body inlet, for measuring the temperature at body inlet and for transmitting signals indicative thereof; and the second located within the tubular cartridge and having a temperature sensing component located adjacent the body outlet, for measuring the temperature at the body outlet and for transmitting signals indicative thereof. Also preferred are one or more pressure transmitters for measuring the pressure across the choke valve.